A Performance-Based Approach to Site-Specific Criteria Development

In the Water Quality Standards [Chapter 173-201A of the Washington Administrative Code (WAC)], streams are assigned designated uses accompanied by criteria that are protective of those uses. The majority of these streams have not been assessed to determine whether or not those criteria can be attained. Some streams may not be able to achieve the numeric criteria due to the natural setting or other conditions affecting the water body. For example there may be pollutants from natural sources, geologic features, or climate factors that make it unlikely the stream, under normal circumstances, would achieve the assigned criteria even if it was in a pristine state. Furthermore, criteria may be unattainable in some streams due to natural low flow conditions.

Some streams seasonally recede to extremely low flows, or become intermittent, or spatially intermittent due to regional climate, hydrology, or geology; yet they, are typically assigned continuous numeric criteria that do not reflect this natural variability. During these seasonal low and stagnant flows some streams are unable to attain numeric criteria even under fully restored natural conditions. However, many of these streams may be able to fully support current designated uses with criteria that reflect natural seasonal water quality variation. For example, a stream may be protective of salmonid spawning, rearing, and migration if the sensitive species or life stage does not utilize the stream during the naturally low flow period. Seasonal criteria could maintain the current criteria for time periods when the sensitive species or its life stage uses the stream but would reflect alternative natural criteria for periods of time when the species is not present or in a life stage that naturally adapts to the seasonal conditions.

The Water Quality Standards (WQS) state that the natural condition of a stream can constitute its water quality criteria as provided by WAC 173-201A-260. The WQS also allow the development and designation of site-specific criteria as provided by WAC 173-201A-430. For streams that reduce to very low flows or intermittency, a site-specific criteria could be applied seasonally and be based on what is protective of the aquatic life use and what the stream can meet under natural conditions. This approach is supported by the following guidance issued by the Environmental Protection Agency (EPA) in February 2015: *A Framework for Defining and Documenting Natural Conditions for Development of Site-Specific Natural Background Aquatic Life Criteria for Temperature, Dissolved Oxygen, and pH: Interim Document*.

According to EPA guidance issued in the Federal Register in 2000, a performance-based approach to site-specific seasonal criteria development can be incorporated into a state's water quality standards. When following the prescribed methodology to develop site-specific criteria to do a waterbody-specific rule change in the WQS, the resulting criteria would be considered approved with minimal review from EPA. Such an approach would include defensible

methodologies, minimum data requirements, and decision thresholds to ensure predictable, repeatable outcomes.

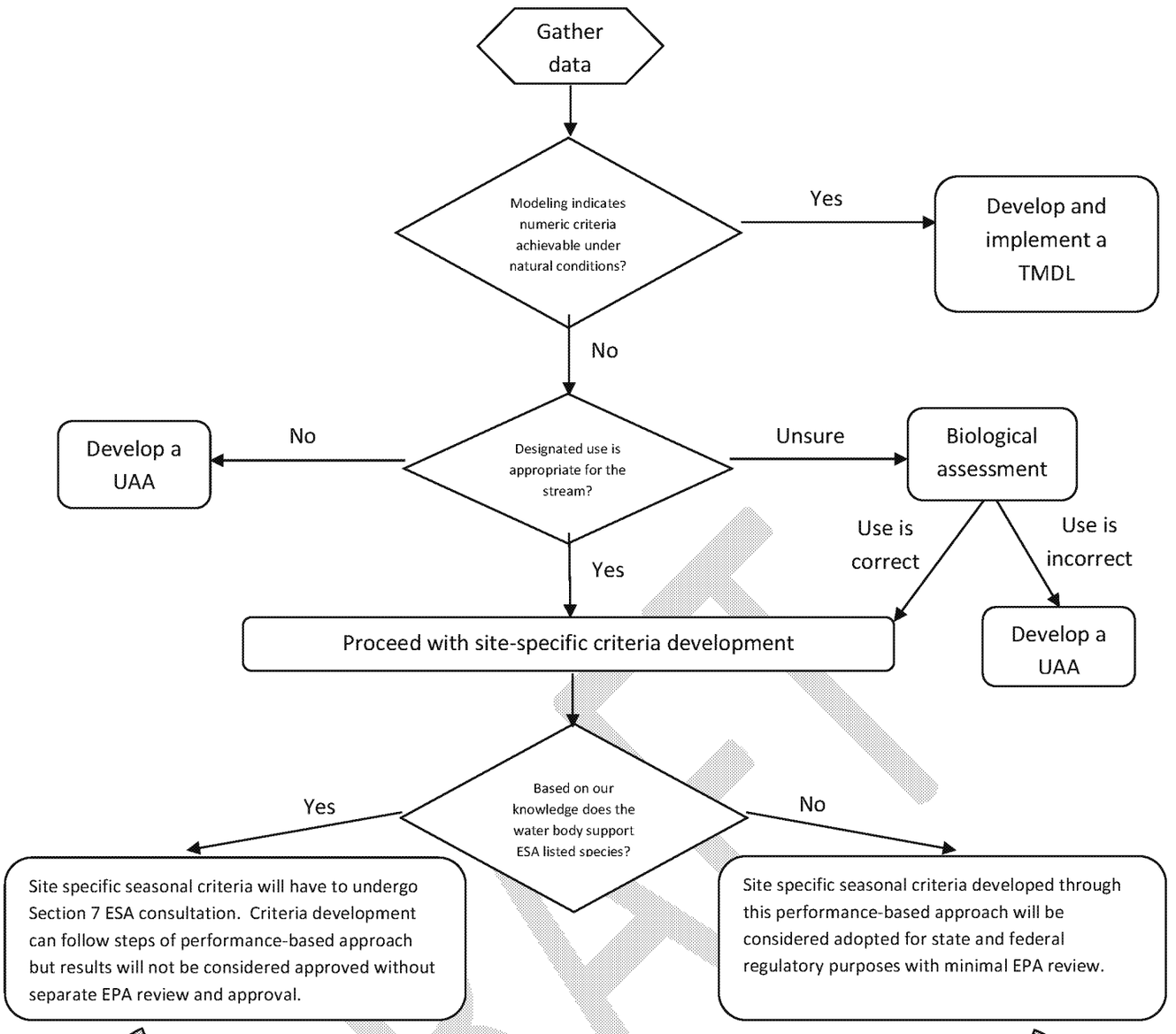
It's important to note that because resulting seasonal site-specific criteria are based on the natural flow and thermal regime of the stream, changing current numeric criteria to align with natural conditions has no effect on what needs to occur to address nonpoint source pollution. System potential shade and all other necessary best management practices would still be required to achieve the site-specific criteria that has been demonstrated in the rule-making process to be sufficient to protect designated aquatic life uses. Changing current numeric criteria to a seasonal or natural condition improves the accuracy and appropriateness of the criteria. A criteria change may have a potential to affect the pollution limits assigned to point sources because those wasteload allocations would be based on those discharges meeting a site-specific criteria that is appropriate for the stream. For dissolved oxygen and pH, these site-specific criteria may not affect pollution limits for point sources because those limits are often set based on an allowable in-stream change rather than the maximum or minimum numeric threshold. It is still however important to have criteria that are aligned with the natural condition and regime of a given parameter especially for the purposes of assessing whether or not the stream is impaired. Setting site-specific criteria would not affect nonpoint source limits, since regardless of the criteria, load allocations are set to meet natural conditions that result from the implementation of best available science and technology for the nonpoint land use.

The following is a description of a potential performance-based approach to site-specific criteria development for intermittent and naturally low flow streams for Washington. It is assumed site-specific seasonal criteria development would primarily be for parameters affected by seasonal flow changes, such as dissolved oxygen, pH, and temperature, and development of the seasonal criteria would occur concurrently with TMDL development.

Data gathering

1. Collect water quality data sufficient for TMDL modeling
2. Determine criteria which are unlikely to be met seasonally under natural conditions?
3. Determine designated uses for stream under consideration
   - 3.1. Is the aquatic life use appropriate based on the known and observed species utilizing the stream?
   - 3.2. Does the species have variable seasonal or life stage use of the stream?
   - 3.3. Are there ESA listed species currently or historically present?
4. For each seasonal or life stage of the species in question, determine criteria (DO, pH, temperature) necessary to support each.

Methodology



Define spatial boundary to which site-specific criteria apply*

- Whole stream
- Stream segment or reach
- Where modeling indicates stream will not attain numeric criteria under fully restored natural conditions

Define duration for site-specific criteria (potential seasonality)*

- Use sensitive species presence/absence time period
- Use timeframes indicated by modeling of natural conditions
- Determine whether one seasonal criterion will be necessary or multiple criteria are necessary through the year based on differing seasonal criteria attainability
- Most will apply to one season and defaulting to use specific criteria the remainder of the year

Determine frequency of site-specific criteria*

- Likely limit criteria exceedance to once every ten years like other criteria

*Boundary, duration, and frequency for all criteria are likely the same but in some cases these may need to be developed for each criterion

Determine magnitude for each parameter

Dissolved Oxygen	pH	Temperature
• Apply criteria derived from species specific requirements for full protection. (EPA & Ecology literature review.) • If modeling indicates this is outside margin of error for what is attainable adopt natural conditions**	• Apply criteria derived from species specific requirements for full protection. (EPA & Ecology literature review.) • If modeling indicates this is outside margin of error for what is attainable adopt natural conditions**	• Apply species appropriate maximum temperatures from Table 11 of 1985 EPA Temperature guidance • If modeling indicates this is outside margin of error for what is attainable adopt natural conditions**

**modeled natural conditions must take into consideration system potential shade, historical stream flow, channel geomorphology/complexity, significant human influenced land uses (use modeling conditions checklist to document)

ESA present

Initiate rulemaking for new site-specific natural conditions including informal public participation (workshops on site-specific criteria to be adopted with comment period) (CR-101)

Formal public participation and public hearings (CR-102)

Incorporate into WQS via rulemaking (CR-103)

Submit to EPA for review, consideration for Section 7 ESA consultation, and approval of standards

Standards reflect site-specific criteria update in Table 602 notes

ESA not present

Initiate rulemaking for new site-specific natural conditions including informal public participation (workshops on site-specific criteria to be adopted with comment period) (CR-101)

Formal public participation and public hearings (CR-102)

Incorporate into WQS via rulemaking (CR-103)

Standards reflect site-specific criteria update in Table 602 notes